

1. d) $\int_2^5 f(x) dx = 10$

$\int_1^2 f(x) = -4$ $\int_1^5 f(x) dx = 6$

$\int_1^2 f(x) dx = -4$ $\int_2^5 f(x) dx = 10$ $\int_1^5 f(x) dx = 6$

$\int_1^2 f(x) dx + \int_2^5 f(x) dx = \int_1^5 f(x) dx$

$-4 + 10 = 6$

$\int_2^5 f(x) dx = \int_1^5 f(x) dx - \int_1^2 f(x) dx$

$= 6 - (-4)$

$= 10$

Nov 15-7:50 AM

1. e) $\int_1^5 f(x) - g(x) dx$

$\int_1^5 f(x) dx - \int_1^5 g(x) dx$

$6 - 8 = -2$

Nov 15-7:58 AM

5.

$$\int_0^3 f(z) dz = 3 \quad \int_0^4 f(z) dz = 7$$

$$a) \int_3^4 f(z) dz =$$

$$\int_0^3 + \int_3^4 = \int_0^4$$

$$3 + \int_3^4 = 7$$

$$\int_3^4 = 7 - 3 = 4$$

Nov 15-7:59 AM

5.3b Definite Integrals and Antiderivatives

Rules for Definite Integrals

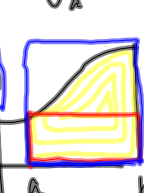
$$\int_a^b f(x) dx = - \int_b^a f(x) dx$$

$$\int_a^a f(x) dx = 0$$

$$\int_a^b k \cdot f(x) dx = k \int_a^b f(x) dx$$

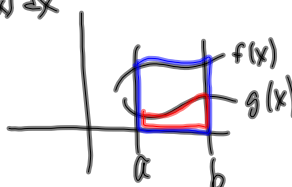
$$\int_a^b f(x) \pm g(x) dx = \int_a^b f(x) dx \pm \int_a^b g(x) dx$$

$$\star \int_a^b f(x) dx + \int_b^c f(x) dx = \int_a^c f(x) dx$$

$$f_{\min} \cdot (b-a) \leq \int_a^b f(x) dx \leq f_{\max} \cdot (b-a)$$


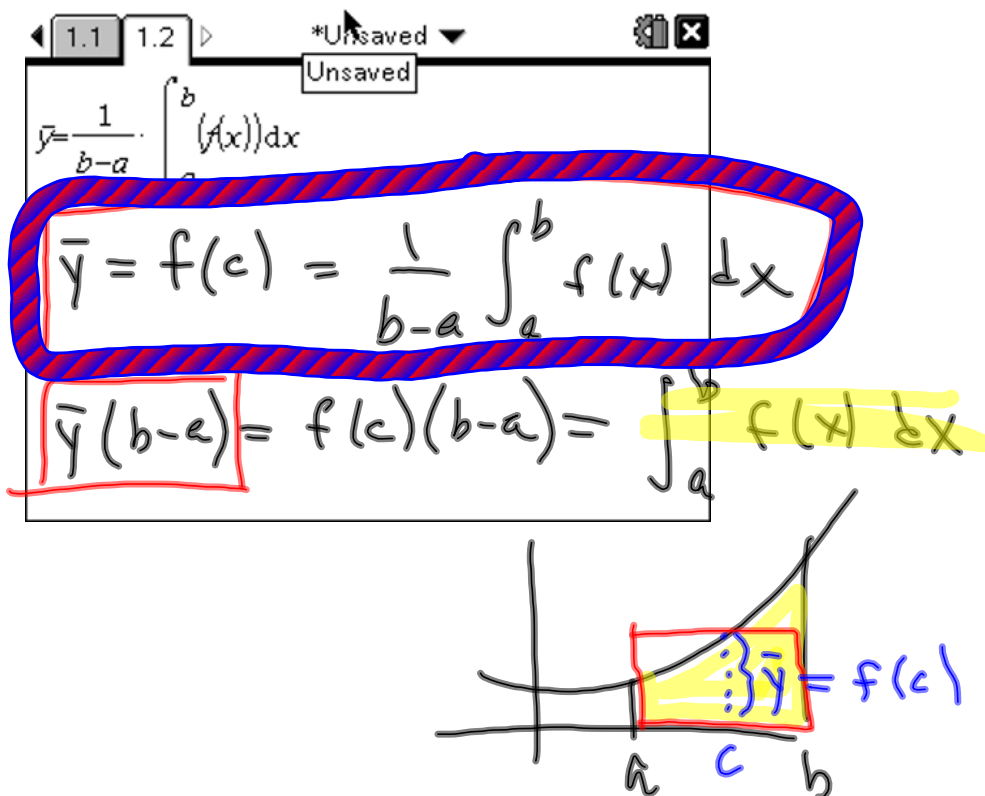
$$\int_a^b f(x) dx \geq \int_a^b g(x) dx$$

$$\text{if } f(x) \geq g(x)$$



Nov 13-4:58 PM

Average (Mean) Value



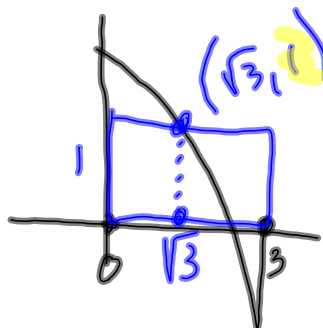
Nov 13-5:05 PM

Find the **average value** of $f(x) = 4-x^2$ on $[0,3]$. Does f actually take on this value at some point on the given interval?

$$\frac{1}{3-0} \int_0^3 \underline{4-x^2} dx = 1$$

$$4-x^2 = 1$$

$$x = \sqrt{3} = c$$

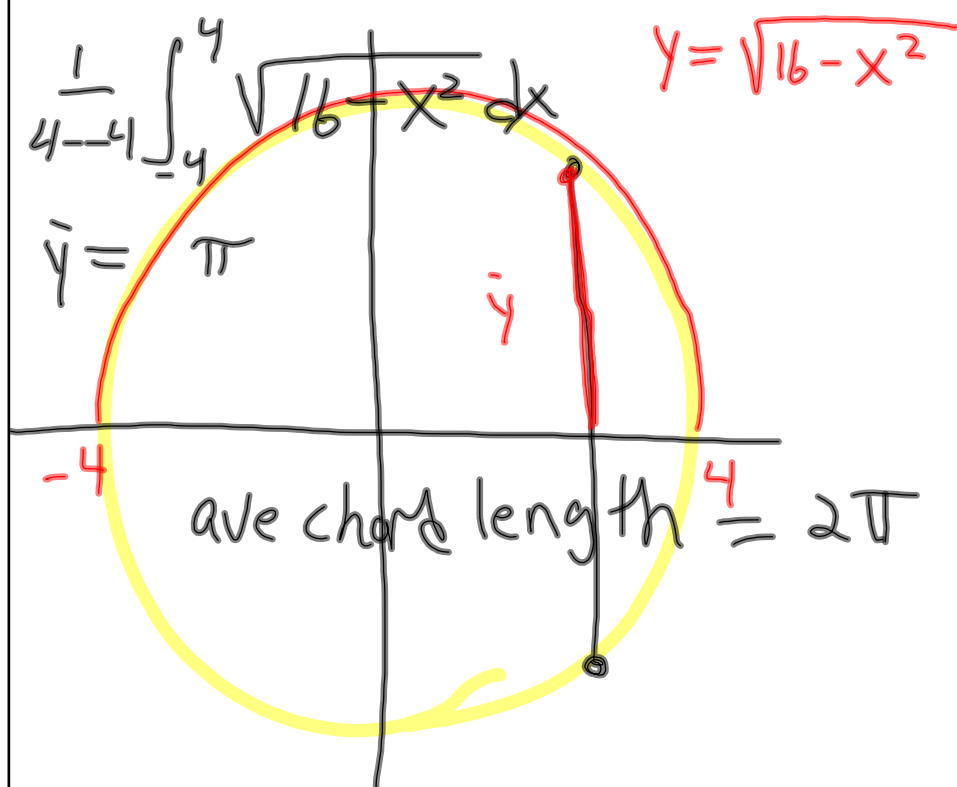


Nov 13-5:12 PM

Mean Value Theorem for Definite Integrals

Nov 13-5:29 PM

How long is the average chord of a circle of radius 4? Find the value that satisfies the Mean Value Theorem for Definite Integrals.



Nov 13-5:31 PM